The NASA NEESPI Data Portal: Products, Information, and Services

AGU, GC41A-0673
San Francisco, CA December 15-19 2008

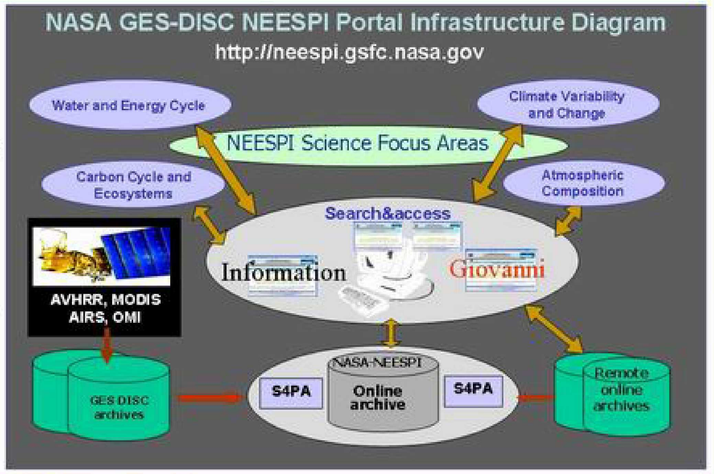
Suhung Shen[1,2], G. Leptoukh[1], T. Loboda[3], I. Csiszar[3], P. Romanov[3], I. Gerasimov[1,4]

[1] NASA Goddard Earth Sciences (GES) Data & Information Services Center (DISC) , Code 610.2, NASA/GSFC , Maryland 20771, USA [2]George Mason University, [3] University of Maryland, [4] ADNET

Suhung.Shen@nasa.gov

Overview

Studies have indicated that land cover and use changes in Northern Eurasia influence global climate system. However, the procedures are not fully understood and it is challenging to understand the interactions between the land changes in this region and the global climate. Having integrated data collections from multiple disciplines are important for studies of climate and environmental changes. Remote sensed and model data are particularly important due to sparse in situ measurements in many Eurasia regions especially in Siberia. The NASA GES DISC (Goddard Earth Sciences Data and Information Services Center) NEESPI data portal has generated infrastructure to provide satellite remote sensing and numerical model data for atmospheric, land surface, and cryosphere. Data searching, subsetting, and downloading functions are available. One useful tool is the Web-based online data analysis and visualization system, Giovanni (Goddard Interactive Online Visualization ANd aNalysis Infrastructure), which allows scientists to assess easily the state and dynamics of terrestrial ecosystems in Northern Eurasia and their interactions with global climate system. Recently, we have created a metadata database prototype to expend the NASA NEESPI data portal for providing a venue for NEESPI scientists to find the desired data easily and leveraging data sharing within NEESPI projects. The database provides product level information. The desired data can be found through navigation and free text search and narrowed down by filtering with a number of constraints. In addition, we have developed a Web Map Service (WMS) prototype to allow access data and images from difference data resources.



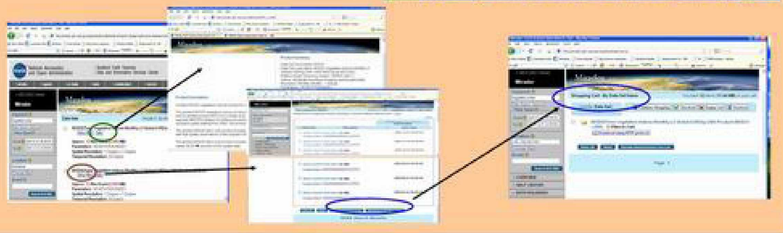
Data Access Tools and Services

Search and Download Data using Mirador

Mirador is a new search and order Web tool developed by the GES DISC. It has a drastically simplified, clean interface and employs the Google mini appliance for metadata keyword searches. Other features include quick response, data file hit estimator, Gazetteer (geographic search by feature name), and an interactive shopping cart.

Mirador supports search by **keyword**, **time span**, and **location**. Keywords can be parameter names, science discipline areas (such as *atmosphere*), instrument, sensor, or model names, or data product short names such as *MOD14CM1*. Time spans can be specified in any unambiguous way (e.g. *Sep 1, 2005* or *9/1/05*). Location can be specified by area name (e.g. Black Sea) or by geographic coordinates. Mirador is supported by a geographic feature Gazetteer.

Event search allows a user to search by an event name including **hurricanes** named **storms**, **cyclones**, and **typhoons**, as well as **volcanoes**, and **air pollution events** (aerosols, ozone)



NEESPI Data Searching Portal

This portal intends to help people find data related to NEESPI project. The portal allows searching for data by project, location, investigator, science keywords, etc. and refining searched results by specify category or text.

Other Data download services

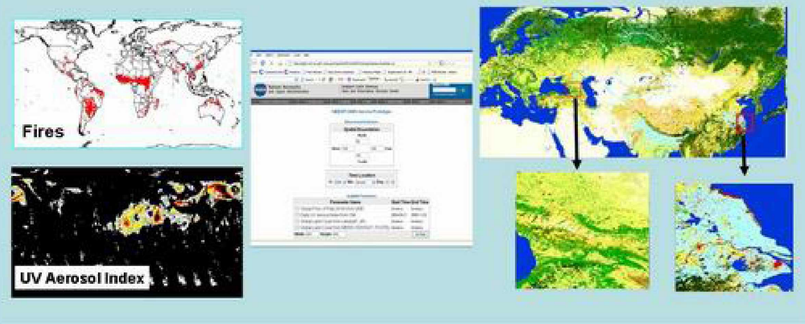
Direct FTP: Direct FTP download from the Simple, Scalable, Script-Based, Science Processing Archive (S4PA) system

OPenDAP: Open-source Project for a Network Data Access Protocol

GIS: OGC-compliant GIS map and coverage servers to provide image and data to remote system

NEESPI WMS Service Prototype

This service allows a user to access data and images from other data service center through the Web Map Service (WMS). Through current prototype, a user can access the fires within 24 hours from Web Fire Mapper, Univ. of Maryland; high resolution land cover map from JPL (LandSat7, highest 15m) and POSTEL (MERIS/ENVISAT,300m); and daily UV aerosol index from GES DISC (OMI, 1x1 deg).



Giovanni NEESPI, An Online Visualization and Data Analysis System:
http://giovanni.gsfc.nasa.gov

Single Parameter Exploration:

- Lat–Lon area plots of time-averaged parameters
- Time-series plots of area-averaged parameters
- Latitude/Longitude–Time Hovmöller diagram
- Animations of consecutive Lat–Lon area plots

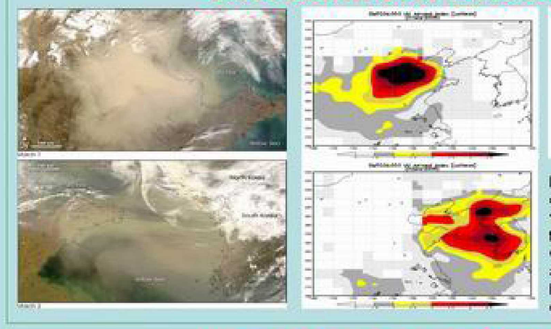
Multi-parameter Intercomparison:

- Lat–Lon area plots of overlain time-averaged parameters
- Time-series plots of multiple parameters
- Time-series of two-parameter differences
- Lat–Lon area plot of two-parameter differences
- Scatter plots with regression statistics
- Temporal correlation maps

Download:

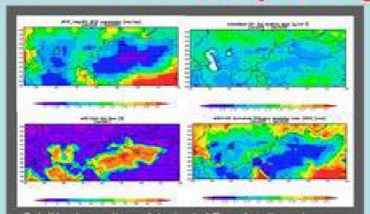
- data in formats: ASCII, hdf, netCDF
- image: PNG, KMZ for Google Earth

Dust Storm over East China

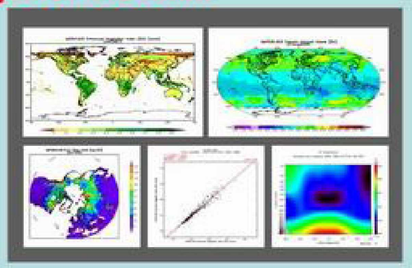


Dust storm over East China was captured by MODIS Terra on Mar 1-2 2008 (True color images, from the NASA Earth Observatory) . The daily UV aerosol index in Giovanni NEESPI shows clearly the same dust storm.

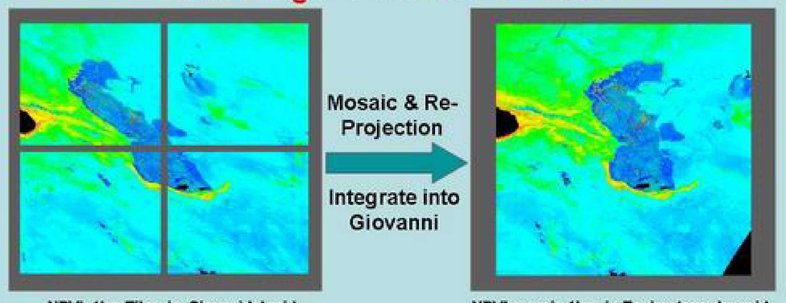
Sample Images of Giovanni



Satellite observations of dry land at Euro-Asia through annual precipitation, Normalized Difference Vegetation Index, Soil moisture, and land cover type.



Future High Resolution Products



NDVI 1km Tiles in Sinusoidal grid

NDVI mosaic 1km in Equirectangular grid

Parameters in Giovanni NEESPI

Group	Parameter Name	Sensor Name	Available since: year.mon	Status: month	Status: day
Atmosphere	Aerosol Optical Depth at 0.55 micron	MODIS - Terra/Aqua	00.02/02.07	OPS	OPS
	Atmospheric Water Vapor (QA -weighted)	MODIS - Terra/Aqua	00.02/02.07	OPS	OPS
	Aerosol Small Mode Fraction	MODIS - Terra/Aqua	00.02/02.07	OPS	OPS
	Cloud Fraction (Day and Night)	MODIS - Terra/Aqua	00.02/02.07	OPS	OPS
	Cloud Fraction (Day only/Night only)]	MODIS - Terra/Aqua	00.02/02.07	OPS	OPS
	Cloud Optical Depth - Total (QA-w)	MODIS - Terra/Aqua	00.02/02.07	OPS	OPS
	Cloud Optical Depth - Ice (QA-w)	MODIS - Terra/Aqua	00.02/02.07	OPS	OPS
	Cloud Optical Depth - Liquid (QA-w)	MODIS - Terra/Aqua	00.02/02.07	OPS	OPS
	Cloud Effective Radius - Total (QA-W)	MODIS - Terra/Aqua	00.02/02.07	OPS	OPS
	Cloud Effective Radius - Ice (QA-W)	MODIS - Terra/Aqua	00.02/02.07	OPS	OPS
	Cloud Effective Radius - Liquid (QA-W)	MODIS - Terra/Aqua	00.02/02.07	OPS	OPS
	Cloud Top Pressure (Day and Night)	MODIS - Terra/Aqua	00.02/02.07	OPS	OPS
	Cloud Top Pressure (Day only/Night only)	MODIS - Terra/Aqua	00.02/02.07	OPS	OPS
	Cloud Top Temperature (Day and Night)	MODIS - Terra/Aqua	00.02/02.07	OPS	OPS
	Cloud Top Temperature (Day only/Night only)	MODIS - Terra/Aqua	00.02/02.07	OPS	OPS
	Column Amount Ozone	Aura OMI	04.08	NA	OPS
	NO2 Total Vertical Column Density	Aura OMI	04.10	NA	TS
	NO2 Tropospheric Vertical Column Density	Aura OMI	04.10	NA	TS
	GPCP precipitation	GPCP Derived	79.01	OPS	WK
Land Surface	Cloud and Overpass Corrected Fire Pixel Count	MODIS - Terra /Aqua	00.11 /02.07	OPS	WK
	Overpass Corrected Fire Pixel Count	MODIS - Terra /Aqua	00.11 /02.07	OPS	WK
	Mean Cloud Fraction over Land for Fire Detection	MODIS - Terra /Aqua	00.11 /02.07	OPS	WK
	Mean Fire Radiative Power	MODIS - Terra /Aqua	00.11 /02.07	OPS	WK
	Enhanced Vegetation Index (EVI)	MODIS - Terra /Aqua	00.02 /02.07	OPS	WK
	Normalized Difference Vegetation Index (NDVI)	MODIS - Terra /Aqua	00.02 /02.07	OPS	WK
	Land Surface Temperature (daytime/nighttime)	MODIS - Terra /Aqua	00.03 /02.07	OPS	WK
	Surface Air Temperature	AIRS	02.08	OPS	OPS
	Surface Skin Temperature	AIRS	02.08	OPS	OPS
	Soil Moisture Mean	AMSR-E	02.07	OPS	WK
Cryosphere	Ice Occurrence Frequency	NESDIS/IMS	00.01	OPS	WK
	Snow Occurrence Frequency	NESDIS/IMS	00.01	OPS	WK

OPS = operational, TS = in testing, WK = working on, NA = Data not available

Acknowledgments:

The project is supported by NASA through ROSES 2005 NNH05ZDA001N-ACCESS.
The authors wish to express great appreciation for the technical support of the Giovanni and S4PA working groups.